

CLAIMS

What is claimed is:

1. A method for constructing an illuminating and reflecting apparatus, said method comprising the steps of:

5 providing a layered metal substrate with an aluminum layer positioned between a first and a second copper layer;

removing at least a defined area of said at least one copper layer to form a reflective portion within said area; and

10 providing a localized light source positioned to allow light to reflect off of said reflective portion.

2. The method of claim 1, further comprising the step of removing an area of said aluminum layer such that a non-planar surface is formed in said aluminum layer.

15 3. The method of claim 2, further comprising the step of removing a defined area of at least one copper layer such that an opening is defined in said layered metal substrate.

4. The method of claim 3, further comprising the step of coating said reflective portion with a substance to provide specific reflectivity levels.

20 5. The method of claim 3, further comprising the step of providing a transparent substrate positioned on said first copper layer.

6. The method of claim 3, further comprising the step of providing a reflective substrate positioned on said second copper layer.

7. A method for forming a reflective aperture in a circuit board for providing illumination in automotive applications, said method comprising the steps of:

providing a layered metal substrate;

5 removing at least a top layer of said layered metal substrate to form a reflective area; and

providing a localized light source positioned so as to allow light to reflect off of said reflective area.

8. The method of claim 7, further comprising the step of defining a non-planar aperture in the middle layer of said layered metal substrate.

9. The method of claim 8, further comprising the step of defining an aperture in the bottom layer of said layered metal substrate aligned with said non-planar aperture in said middle layer.

10. A method for forming a reflective aperture in a circuit board for providing illumination in automotive applications, said method comprising the steps of:

providing a layered metal substrate;

applying a layer of masking material on a surface of at least one layer of said layered metal substrate;

20 exposing said layered metal substrate to an etching process;

removing said masking material from said at least one layer of said layered metal substrate to expose reflective areas of said aluminum layer; and

providing a localized light source positioned so as to allow light to reflect off of said reflective area.

11. The method of claim 10, further comprising the steps of:

applying a layer of masking material on a surface of said aluminum layer;

exposing said layered metal substrate to an aluminum etching process;
and

removing said masking material from said aluminum layer.

12. The method of claim 11, further comprising the step of defining a non-planar aperture in the middle layer of said layered metal substrate.

13. The method of claim 12, further comprising the step of defining an aperture in the bottom layer of said layered metal substrate aligned with said non-planar aperture in said middle layer.

14. A reflective circuit board comprising:

a substrate comprised of a layer of aluminum positioned between two layers of copper;

at least one exposed area of reflective aluminum; and

a localized light source positioned to provide illumination of said exposed aluminum.

15. The reflective circuit board of claim 14, further comprising a non-planar aperture defined in said aluminum layer.

16. The reflective circuit board of claim 15, further comprising an aperture defined through all of said layers of said substrate.

17. The reflective circuit board of claim 15, further comprising a reflective coating on said non-planar surfaces of said aluminum layer.

18. The reflective circuit board of claim 16, wherein said localized light source is substantially aligned with said aperture.

19. The reflective circuit board of claim 18, further comprising a layer of reflective substrate over said aperture opposite said localized light source.

20. The reflective circuit board of claim 14, further comprising a layer of transparent substrate over said at least one layer of exposed aluminum.